

Amendments to the Claims

The following listing of claims replaces all prior versions of the claims and all prior listings of the claims in the present application.

Claims 1-58 (canceled)

Claim 59 (new): A tyre for a vehicle wheel, comprising:

a carcass structure;

a belt structure disposed circumferentially around the carcass structure;

a tread band disposed circumferentially around the belt structure; and

sidewalls provided on opposite side portions of the carcass structure;

wherein the carcass structure comprises:

at least one carcass ply comprising thread elements substantially disposed

transversely with respect to a circumferential extension of the carcass

structure; and

at least one pair of annular reinforcing structures disposed close to respective

inner circumferential edges of the at least one carcass ply;

wherein each of the annular reinforcing structures comprises:

at least one first circumferentially-inextensible annular insert, substantially in a

form of a crown, disposed substantially coaxially with respect to the

carcass structure close to one of the respective inner circumferential edges

of the at least one carcass ply; and

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at least one second circumferentially-inextensible annular insert, substantially in a
form of a crown, disposed substantially coaxially with respect to the
carcass structure;

wherein the at least one first annular insert is formed of at least one first elongated
element extending in concentric coils,

wherein the at least one second annular insert is formed of at least one second elongated
element extending in concentric coils,

wherein the at least one carcass ply comprises end flaps,

wherein each end flap is turned back around an inner circumferential edge of a respective
first annular insert,

wherein each end flap is axially interposed between respective first and second annular
inserts, and

wherein the at least one carcass ply and each first annular insert abut against each other
along either:

a whole surface extension of the first annular inserts; or

a whole radial extension of the end flaps.

Claim 60 (new): The tyre of claim 59, further comprising at least one filling body of
elastomer material in contact with at least one of the annular inserts.

Claim 61 (new): The tyre of claim 60, wherein the at least one second annular insert is
interposed between a respective end flap and the at least one filling body, and


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wherein the at least one second annular insert is in contact with an end flap on an opposite side with respect to the at least one first annular insert.

Claim 62 (new): The tyre of claim 59, wherein an end flap of the at least one carcass ply completely covers a respective first annular insert.

Claim 63 (new): The tyre of claim 59, wherein the at least one second annular insert projects beyond one end region of a respective end flap.

 Claim 64 (new): The tyre of claim 59, wherein each second annular insert projects beyond an outer circumferential edge of respective first annular inserts.

Claim 65 (new): The tyre of claim 59, wherein the at least one first annular insert comprises:

at least one first series of concentric coaxial coils; and

at least one second series of concentric coaxial coils;

wherein the coils of the at least one second series are disposed in axial side-by-side relationship with the coils of the at least one first series.


Claim 66 (new): The tyre of claim 65, wherein a number of coils of the at least one first series is greater than a number of coils of the at least one second series.

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Claim 67 (new): The tyre of claim 66, wherein the at least one first series of coils is directly in contact with the at least one carcass ply, and
wherein the at least one second series of coils is directly in contact with a respective end flap.

Claim 68 (new): The tyre of claim 59, wherein the at least one first annular insert projects beyond one end region of a respective end flap.

 Claim 69 (new): The tyre of claim 59, wherein the at least one first annular insert projects beyond an outer circumferential edge of a respective second annular insert.

Claim 70 (new): The tyre of claim 60, wherein the at least one filling body is interposed between a respective end flap of the at least one carcass ply and a respective second annular insert.

Claim 71 (new): The tyre of claim 70, wherein the at least one second annular insert is directly in contact with at least one axially-outer side surface of a respective filling body, and
wherein the at least one second annular insert is disposed on an opposite side of the respective filling body relative to the respective end flap of the at least one carcass ply.

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Claim 72 (new): The tyre of claim 60, wherein the at least one filling body comprises a circumferentially-outer portion directly in contact with a side surface of the at least one carcass ply.

Claim 73 (new): The tyre of claim 59, wherein the at least one carcass ply further comprises:

a plurality of strip sections each comprising at least two of the thread elements disposed longitudinally and parallel to each other and at least partly covered with at least one layer of raw elastomer material;

wherein each of the strip sections extends in a substantially U-shaped configuration according to a cross-section outline of the carcass structure to define two side portions and a crown portion,

wherein the side portions substantially extend in planes orthogonal to a geometric axis of the carcass structure at mutually-spaced-apart positions in an axial direction,

wherein the crown portion extends at a radially-outer position between the side portions,

wherein the crown portions are disposed in side-by-side relationship with each other along the circumferential extension of the carcass structure, and

wherein the side portions of each strip section are each partly covered with a side portion of at least one adjoining strip section.

Claim 74 (new): The tyre of claim 73, wherein the side portions of the strip sections mutually converge towards the geometric axis of the carcass structure, and

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wherein covering of the side portions of the strip sections progressively increases in a direction of the inner circumferential edge of the at least one carcass ply, starting from a zero value close to transition regions between the side portions and the crown portions.

Claim 75 (new): A method of manufacturing a tyre for a vehicle wheel, comprising:

making a carcass structure;

disposing a belt structure circumferentially around the carcass structure;

disposing a tread band circumferentially around the belt structure; and

providing sidewalls on opposite side portions of the carcass structure;

wherein making the carcass structure comprises:

making at least one carcass ply comprising a pair of inner-circumferential end flaps;

forming two or more annular reinforcing structures; and

applying at least one of the annular reinforcing structures close to each end flap of the at least one carcass ply;

wherein forming each annular reinforcing structure comprises:

applying at least one first circumferentially-inextensible annular insert close to a respective end flap of the at least one carcass ply;

turning back the respective end flap of the at least one carcass ply around an inner circumferential edge of the at least one first annular insert; and

applying at least one second circumferentially-inextensible annular insert close to the at least one first annular insert;

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wherein the at least one first annular insert is formed of at least one first elongated element extending in concentric coils,

wherein the at least one second annular insert is formed of at least one second elongated element extending in concentric coils, and

wherein the at least one carcass ply and each first annular insert abut against each other along either:

a whole surface extension of the first annular inserts; or

a whole radial extension of the end flaps.

 Claim 76 (new): The method of claim 75, further comprising applying at least one filling body of elastomer material in contact with at least one of the annular inserts.

Claim 77 (new): The method of claim 75, wherein at least one of the first and second annular inserts is formed by winding up a continuous elongated element in radially-superposed concentric coils.

Claim 78 (new): The method of claim 75, wherein at least one of the first and second annular inserts is formed directly against the at least one carcass ply.

Claim 79 (new): The method of claim 75, wherein at least one of the first and second annular inserts is formed in a forming die, and

wherein the forming die is subsequently moved against the at least one carcass ply for applying the at least one annular insert.

Claim 80 (new): The method of claim 75, wherein turning back the respective end flap comprises:

axially pushing the end flap from a first position to a second position; and

exerting a rolling action on the end flap for laterally applying the end flap against the at least one first annular insert;

wherein, in the first position, the end flap projects radially inward with respect to the at least one first annular insert, and

wherein, in the second position, the end flap is axially oriented away from an equatorial plane of the carcass structure.

Claim 81 (new): The method of claim 76, wherein applying the at least one filling body comprises:

making the at least one filling body in a forming die; and

axially moving the forming die against the carcass structure.

Claim 82 (new): The method of claim 81, further comprising coupling the at least one filling body with the at least one second annular insert in the forming die before simultaneously applying the at least one filling body and the at least one second annular insert against the carcass structure.


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Claim 83 (new): The method of claim 76, wherein applying the at least one filling body comprises forming the at least one filling body directly against the carcass structure.

Claim 84 (new): The method of claim 83, wherein forming the at least one filling body directly against the carcass structure comprises extruding at least one continuous strip element wound up in superposed coils.

Claim 85 (new): The method of claim 75, wherein making the at least one carcass ply comprises:



preparing strip sections each comprising longitudinal and parallel thread elements at least partly coated with at least one layer of raw elastomer material; and

depositing each of the strip sections onto a toroidal support in a substantially U-shaped conformation around a cross-section outline of the toroidal support to define two side portions and a crown portion;

wherein the side portions substantially extend in planes orthogonal to a geometric axis of the toroidal support at mutually-spaced-apart positions in an axial direction,

wherein the crown portion extends at a radially-outer position between the side portions,

wherein the crown portions are disposed in side-by-side relationship with each other along a circumferential extension of the toroidal support, and

wherein the side portions of each strip section are each partly covered with a side portion of at least one adjoining strip section.

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Claim 86 (new): The method of claim 85, wherein the side portions of the strip sections mutually converge toward the geometric axis of the toroidal support, and

wherein covering of the side portions of the strip sections progressively increases in a direction of an inner circumferential edge of the at least one carcass ply, starting from a zero value close to transition regions between the side portions and the crown portions.

Claim 87 (new): The method of claim 85, wherein the strip sections are deposited so that the side portions of each strip section project from an inner circumferential edge of the toroidal support, and

wherein projecting ends of the side portions define the end flaps of the at least one carcass ply.

Claim 88 (new): A tyre for a vehicle wheel, comprising:

a carcass structure;

a belt structure disposed circumferentially around the carcass structure;

a tread band disposed circumferentially around the belt structure; and

sidewalls provided on opposite side portions of the carcass structure;

wherein the carcass structure comprises:

at least one carcass ply comprising thread elements substantially disposed

transversely with respect to a circumferential extension of the carcass

structure; and

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at least one pair of annular reinforcing structures disposed close to respective
inner circumferential edges of the at least one carcass ply;

wherein each of the annular reinforcing structures comprises:

at least one first circumferentially-inextensible annular insert, substantially in a
form of a crown, disposed substantially coaxially with respect to the
carcass structure close to one of the respective inner circumferential edges
of the at least one carcass ply; and

at least one second circumferentially-inextensible annular insert, substantially in a
form of a crown, disposed substantially coaxially with respect to the
carcass structure;

wherein the at least one first annular insert is formed of at least one first elongated
element extending in concentric coils,

wherein the at least one second annular insert is formed of at least one second elongated
element extending in concentric coils,

wherein the at least one carcass ply comprises end flaps,

wherein each end flap is turned back around an inner circumferential edge of a respective
first annular insert,

wherein each end flap is axially interposed between respective first and second annular
inserts, and

wherein each first and second annular insert exhibits a radially-elongated transverse
section outline.

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Claim 89 (new): The tyre of claim 88, further comprising at least one filling body of elastomer material in contact with at least one of the annular inserts.

Claim 90 (new): The tyre of claim 89, wherein the at least one second annular insert is interposed between a respective end flap and the at least one filling body, and

wherein the at least one second annular insert is in contact with an end flap on an opposite side with respect to the at least one first annular insert.

Claim 91 (new): The tyre of claim 88, wherein an end flap of the at least one carcass ply completely covers a respective first annular insert.

Claim 92 (new): The tyre of claim 88, wherein the at least one second annular insert projects beyond one end region of a respective end flap.

Claim 93 (new): The tyre of claim 88, wherein each second annular insert projects beyond an outer circumferential edge of respective first annular inserts.

Claim 94 (new): The tyre of claim 88, wherein the at least one first annular insert comprises:

at least one first series of concentric coaxial coils; and

at least one second series of concentric coaxial coils;

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wherein the coils of the at least one second series are disposed in axial side-by-side relationship with the coils of the at least one first series.

Claim 95 (new): The tyre of claim 94, wherein a number of coils of the at least one first series is greater than a number of coils of the at least one second series.

Claim 96 (new): The tyre of claim 95, wherein the at least one first series of coils is directly in contact with the at least one carcass ply, and

wherein the at least one second series of coils is directly in contact with a respective end flap.

Claim 97 (new): The tyre of claim 88, wherein the at least one first annular insert projects beyond one end region of a respective end flap.

Claim 98 (new): The tyre of claim 88, wherein the at least one first annular insert projects beyond an outer circumferential edge of a respective second annular insert.

Claim 99 (new): The tyre of claim 89, wherein the at least one filling body is interposed between a respective end flap of the at least one carcass ply and a respective second annular insert.

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Claim 100 (new): The tyre of claim 99, wherein the at least one second annular insert is directly in contact with at least one axially-outer side surface of a respective filling body, and wherein the at least one second annular insert is disposed on an opposite side of the respective filling body relative to the respective end flap of the at least one carcass ply.

Claim 101 (new): The tyre of claim 89, wherein the at least one filling body comprises a circumferentially-outer portion directly in contact with a side surface of the at least one carcass ply.

Claim 102 (new): The tyre of claim 88, wherein the at least one carcass ply further comprises:

a plurality of strip sections each comprising at least two of the thread elements disposed longitudinally and parallel to each other and at least partly covered with at least one layer of raw elastomer material;

wherein each of the strip sections extends in a substantially U-shaped configuration according to a cross-section outline of the carcass structure to define two side portions and a crown portion,

wherein the side portions substantially extend in planes orthogonal to a geometric axis of the carcass structure at mutually-spaced-apart positions in an axial direction,

wherein the crown portion extends at a radially-outer position between the side portions,

wherein the crown portions are disposed in side-by-side relationship with each other along the circumferential extension of the carcass structure, and

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wherein the side portions of each strip section are each partly covered with a side portion of at least one adjoining strip section.

Claim 103 (new): The tyre of claim 102, wherein the side portions of the strip sections mutually converge towards the geometric axis of the carcass structure, and

wherein covering of the side portions of the strip sections progressively increases in a direction of the inner circumferential edge of the at least one carcass ply, starting from a zero value close to transition regions between the side portions and the crown portions.

Claim 104 (new): A method of manufacturing a tyre for a vehicle wheel, comprising:

making a carcass structure;

disposing a belt structure circumferentially around the carcass structure;

disposing a tread band circumferentially around the belt structure; and

providing sidewalls on opposite side portions of the carcass structure;

wherein making the carcass structure comprises:

making at least one carcass ply comprising a pair of inner-circumferential end flaps;

forming two or more annular reinforcing structures; and

applying at least one of the annular reinforcing structures close to each end flap of the at least one carcass ply;

wherein forming each annular reinforcing structure comprises:

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applying at least one first circumferentially-inextensible annular insert close to a
respective end flap of the at least one carcass ply;
turning back the respective end flap of the at least one carcass ply around an inner
circumferential edge of the at least one first annular insert; and
applying at least one second circumferentially-inextensible annular insert close to
the at least one first annular insert;
wherein the at least one first annular insert is formed of at least one first elongated
element extending in concentric coils,
wherein the at least one second annular insert is formed of at least one second elongated
element extending in concentric coils, and
wherein each first and second annular insert exhibits a radially-elongated transverse
section outline.

Claim 105 (new): The method of claim 104, further comprising applying at least one
filling body of elastomer material in contact with at least one of the annular inserts.

Claim 106 (new): The method of claim 104, wherein at least one of the first and second
annular inserts is formed by winding up a continuous elongated element in radially-superposed
concentric coils.

Claim 107 (new): The method of claim 104, wherein at least one of the first and second
annular inserts is formed directly against the at least one carcass ply.

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Claim 108 (new): The method of claim 104, wherein at least one of the first and second annular inserts is formed in a forming die, and

wherein the forming die is subsequently moved against the at least one carcass ply for applying the at least one annular insert.

Claim 109 (new): The method of claim 104, wherein turning back the respective end flap comprises:

axially pushing the end flap from a first position to a second position; and

exerting a rolling action on the end flap for laterally applying the end flap against the at least one first annular insert;

wherein, in the first position, the end flap projects radially inward with respect to the at least one first annular insert, and

wherein, in the second position, the end flap is axially oriented away from an equatorial plane of the carcass structure.

Claim 110 (new): The method of claim 105, wherein applying the at least one filling body comprises:

making the at least one filling body in a forming die; and

axially moving the forming die against the carcass structure.

Claim 111 (new): The method of claim 110, further comprising coupling the at least one filling body with the at least one second annular insert in the forming die before simultaneously

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applying the at least one filling body and the at least one second annular insert against the carcass structure.

Claim 112 (new): The method of claim 105, wherein applying the at least one filling body comprises forming the at least one filling body directly against the carcass structure.

Claim 113 (new): The method of claim 112, wherein forming the at least one filling body directly against the carcass structure comprises extruding at least one continuous strip element wound up in superposed coils.

Claim 114 (new): The method of claim 104, wherein making the at least one carcass ply comprises:

preparing strip sections each comprising longitudinal and parallel thread elements at least partly coated with at least one layer of raw elastomer material; and

depositing each of the strip sections onto a toroidal support in a substantially U-shaped conformation around a cross-section outline of the toroidal support to define two side portions and a crown portion;

wherein the side portions substantially extend in planes orthogonal to a geometric axis of the toroidal support at mutually-spaced-apart positions in an axial direction,

wherein the crown portion extends at a radially-outer position between the side portions,

wherein the crown portions are disposed in side-by-side relationship with each other along a circumferential extension of the toroidal support, and

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wherein the side portions of each strip section are each partly covered with a side portion of at least one adjoining strip section.

Claim 115 (new): The method of claim 114, wherein the side portions of the strip sections mutually converge toward the geometric axis of the toroidal support, and

wherein covering of the side portions of the strip sections progressively increases in a direction of an inner circumferential edge of the at least one carcass ply, starting from a zero value close to transition regions between the side portions and the crown portions.

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Claim 116 (new): The method of claim 114, wherein the strip sections are deposited so that the side portions of each strip section project from an inner circumferential edge of the toroidal support, and

wherein projecting ends of the side portions define the end flaps of the at least one carcass ply.

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